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EBRI

DEFINED BENEFIT OR DEFINED CONTRIBUTION:
WHICH IS BETTER FOR THE CIVIL SERVANT?

by

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The Social Security legislation now being deliberated by Congress will have significant effects across society. Among most of the working population it will mean higher payroll taxes, at least in the short term. For beneficiaries it will mean a delay in cost of living adjustments and for some, taxation of part of their Social Security benefits.

Among the other changes, new federal workers hired after January 1, 1984 will be covered by Social Security. This means that a new or modified federal retirement plan will have to be devised which will coordinate federal retirement benefits with Social Security. There are several practical and political questions that must be addressed in the derivation of that plan. While there will ultimately be a substantive debate over the level of benefits to be provided by the Federal retirement plan, funding procedures for the plan and a host of other particulars, the first decision that has to be made is on the type of plan that will be offered. This paper presents some of the traditional arguments for selecting one or the other of the two traditional types of pension plans.

BACKGROUND

The earliest retirement program in this country can be traced back to 1636 when the settlers at Plymouth Colony decreed "that any man sent forth as a soldier and returned maimed should be maintained by the colony during his life." The colonies made similar provisions for men who were disabled and for survivors of men who were killed in military expeditions against the Indians.

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The first national pension law, which dates back to 1776, provided half pay for life, or during disability, for soldiers disabled during the Revolutionary War. Military pensions based on service date back to 1780. Gradually, service pensions came to be provided seperately for veterans of each war. In 1862, the first major nondisability program provided for voluntary retirement of military officers after forty years of duty. In 1885, nondisability retirement was extended to Marine and Army enlistees, providing voluntary retirement after thirty years of service. 1/

Civilian retirement programs in this country date back to the end of the eighteenth century. In 1794 Albert Gallatin established the first recorded profit-sharing plan in his glassworks in Pennsylvania. New York City established a pension system for its policemen in 1857. A smattering of additional local public pensions were started during the remainder of the nineteenth century. In 1911 Massachusetts established the first state retirement program for public employees. About a dozen private pension plans existed in 1900; the number grew to about 60 by 1910, 270 by 1920, and 420 by 1930. 2/ The Federal Civil Service Retirement System began in 1920.

Early on, pensions were established for many of the same reasons they are still being established today, including employers' desires to encourage retirement of older workers so younger ones could move up the organizational ladder, and employers' desires to entice superior workers and discourage excessive turnover by providing an attractive compensation package.

1/ Office of the Actuary, Defense Manpower Data Center, Valuation of the Military Retirement System: Fiscal Year 1980 (Washington, D.C.: U.S. Government Printing Office, 1981), p. 1.
2/ M. W. Latimer, Industrial Pension Systems in the United States and Canada (New York: Industrial Relations Counselors, Inc., 1933).

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Most of the early pension plans provided no benefits prior to age sixty-five, and they often required twenty or more years of continuous service prior to retirement. Some of the early plans included restrictions prohibiting the hiring of workers over forty-five to fifty-five years of age. Many of the early pension plans were "final-pay" plans, which provided annual benefits equal to 1.0 to 1.5 percent of final average pay for each year of service.

By the mid-1970s private pension funds held billions of dollars in assets. Occasional cases of inadequate funding, poor administration and embezzlement received wide publicity. To remedy these problems and to increase pension participant and beneficiary rights, Congress enacted the 1974 Employee Retirement Income Security Act (ERISA). This legislation does not require employers to adopt employee pension programs. Where voluntary plans are established, however, they must comply with extensive reporting and fiduciary requirements and minimum standards of coverage, participation, vesting and benefit funding. ERISA also created the Pension Benefit Guaranty Corporation to ensure a level of vested benefits when defined benefit plans terminate.

Under ERISA, private employer pension plans generally must provide coverage on an indiscriminatory basis to all employees age 25 or older with one or more years of service. Employers must also adopt a vesting schedule that satisfies one of three vesting standards. One standard requires total vesting after ten years of service. The other two require phased-in vesting after a designated period of service or a specified combination of service and age, and full vesting after fifteen years of service.

Though ERISA established extensive minimum requirements, employers continue to have considerable flexibility in determining many plan design

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aspects. For example, private plans can be defined contribution, (i.e., contribution amounts are predetermined while benefit levels are variable and dependent on the total contributions and earnings in each employee's account). Conversely, private plans can be defined benefit, (i.e., benefit levels are determined in advance and contributions are variable but must be sufficient to satisfy promised benefits). In both instances benefit levels generally rise with increases in an employee's wages and length of service.

It is clear that the Federal Government does not have to comply with the pension laws or regulations that it propagates for private sector plans. The current CSRS, for example, is in clear violation of the funding and vesting standards in ERISA. However, for the purposes of this analysis, it is presumed that certain ERISA standards would be met by the modified federal retirement plan regardless of the type of plan (i.e., defined benefit or defined contribution) that is put in place. It is assumed that participation in the federal retirement plan would begin at the point of hire, as is generally the case with the current plan. It is assumed that as in CSRS the plan would have a five year vesting provision but that it would comply with ERISA vesting standards relative to employer contributions to the plan. Simply, this means that once an employee becomes vested, he or she would ultimately be entitled to a benefit.

COMPARING THE GENERIC ALTERNATIVES

Both defined contribution and defined benefit plans are organized retirement plans. Without inferring who actually bears the incidence of program costs, most of these programs are largely supported by employer contributions. From the employee's perspective either type of plan helps provide income security in retirement. From the employer's perspective either

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helps in the orderly recruiting, maintenance and retirement of the necessary workforce.

The defined benefit plan provides a clearly stated retirement income level generally related to years of service and a measure of salary toward the end of employment tenure. The defined contribution plan, on the other hand, provides for specified contribtuions to an individually allocated investment account. Without comparing the actual level of benefits provided to specific individuals under one plan or the other, the two types of plans can be compared from an equity perspective. In this regard Trowbridge argues:

> That the employer contributes the same percentage of pay for every covered employee is a philosophical strength of the defined contribution arrangement. The underlying principle of equity is that individual workers enjoy benefits of equal value.
>
> In defined benefit pension plans, as in most group insurance arrangements, the principal is one of equal benefits. Equal benefits are rarely the same as benefits of equal value, because employees vary as to age, sex, and other risk characteristics.
>
> In summary, defined contribution plans define individual equity in terms of equal employer contributions and accept the necessarily unequal benefits that equal contributions provide. Defined benefit plans define equity in terms of equal benefits and accept the necessarily unequal employer contributions. 3/

In addition to these equity differences that apply under the *ceteris paribus* conditions, there are other differences in the two approaches to pension provision that arise because other things are not always equal. These

3/ "Defined Benefit and Defined Contribution Plans: An Overview," in *Economic Survival in Retirement: Which Pension Is for You?* (Washington, D.C.: The Employee Benefit Research Institute, 1982), pp. 3-34.

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arise partly because of the inherent differences in the two types of plans, but also because of tradition and the differential treatment of the plan types under the tax and regulatory code.

PLAN DIFFERENCES

The relative desirability of a defined benefit versus a defined contribution plan depends a great deal on the goals the plan is supposed to meet. If everyone's goals coincided, then an ultimate plan design could be arrived at easily. There are several players concerned about the design of a new federal retirement plan who do not have coincidental goals. Therefore, they need to evaluate the relative merits of the two major approaches to see if a consensus can be attained on a general approach. In order to reach such a consensus some of the differences in the two retirement plan approaches should be considered.

Defined benefit (DB) plan are often preferred because they can provide retrospective credits whereas defined contribution (DC) plans are prospective. This is especially the case at the time the plan is established if there are workers with several years of tenure who will be covered by the new plan. This ability to grant past service credits is particularly attractive where an employer is offering a pension for the first time. This is not the case with the federal government but may be important if current workers are given the option and encouraged to transfer to the new program. It is also important in the case of benefit enhancements. Under DB plans such enhancement can be granted on the basis of prior service. With a DC plan this is far more complicated, if not practically impossible.

An important reason that it is difficult to provide such retroactive protection under a DC plan is that employers do not typically keep lifetime

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historical earnings records on which such a benefit increase would be based. The most important reason, however, is because of the different funding procedures used in the two approaches. The DC plan by nature is always fully funded, although a federally sponsored plan might be somewhat unique in this regard. To grant retroactive credits under such a plan could require a crushing contribution to fund such benefits. The DB plan, on the other hand, would allow the creation of an unfunded liability that could be amortized over several years. While it is impossible to project the likelihood of future benefit enhancements in a new federal retirement program, the CSRS has a long history of gradual benefit improvements that have been granted retroactively.

A second difference between DB and DC plans is that they are structurally different. This is important because it affects the participants' understanding and attitudes toward the plan. In the DB plan the participants can be educated to understand that their benefits will replace a closely estimated percentage of their final earnings and that the pension in combination with Social Security will maintain an estimable portion of the preretirement standard of living. The DC plan provides a clearly perceptible growing account balance. A problem that many workers have is in comparing the relative values of the two types of plans. The defined benefit is stated in flow terms while the defined contribution is a stock.

The stock and flow differentials in the two plan types can be easily reconciled by actuaries and economists. For the individual worker the stock concept may be more easily understood during the period of accumulation, but it is the flow of income that is important in retirement. A person's standard of living is largely determined by the flow of goods and services they can consume over time. While the defined contribution accumulation can be converted to an

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annuity at retirement most workers cannot readily estimate the extent to which their preretirement earnings will be replaced until the end of their career. In part, this is the result of the arithmetic involved in converting stocks to flows. It is also the result of uncertain projections of the stock values which themselves are subject to inflationary and market forces that are not always understood.

The latter point relates to a third difference between DB and DC plans. In the defined contribution plan investment performance directly affects the level of benefits. Because contributions and interest accruals relate to specific persons, the risk of adverse market performance is borne by the individual worker. Under the defined benefit plan, on the other hand, the individual is promised a level of benefits related to final salary. Adverse market performance can reduce the value of the pension portfolio as in the case of the DC plan. However, the employer has guaranteed the benefit and has to adjust contributions to make up for bad investment performance.

There are also traditional differences between DB and DC plans that have evolved because they are perceived differently by workers. The perceived accrual of a capital stock in the defined contribution plan raises the employee's consciousness of the value of accumulating assets. The accumulated value of the asset is also much more portable than a vested defined benefit promise. The individually assigned assets can be liquidated and reinvested in an individual retirement account, making them highly portable. This combined perception of a definable asset, along with relative portability may combine to account for typically shorter vesting in DC plans. For the highly mobile worker, the defined contribution plan may be preferred because of its portability characteristics. For the long-term stable employee, on the other

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hand, the primary concern is likely to be an adequate level of benefits to maintain preretirement earnings standards. This will more likely be assured through a defined benefit plan. Most defined contribution plans do not have automatic provisons to convert the accumulated assets to an annuity at retirement. The more typical cash-out provisions in these plans are often criticized because it is feared the accumulated funds are often not used for retirement income security purposes. It is the conflicting goals of different workers, employee groups, employer and public policy goals that makes selecting one type of plan over the other difficult.

COMPARING SPECIFIC PLANS

During 1978 and 1979 a study of feasibility and desirabiltiy of mandatory coverage of federal workers under Social Security was conducted in accordance with a Congressional mandate included in the 1977 Social Security Amendments. This study was carried out by a special study group staff set up within the Department of Health, Education and Welfare (now Health and Human Services). This study group staff worked directly with compensation and actuarial staffs at the Office of Personnel Management. They also worked with the policy staff in the Office of the Secretary at HEW and received additional support from the Social Security Administration. The final report of the study group 4/ was reviewed by the Departments of HEW, Treasury and Labor as well as the Office of Personnel Management and the Office of Management and Budget.

In conducting their analysis the study group with the aid of OPM staff developed a series of supplementary pension plans that would coordinate the

4/ Final report of the Universal Social Security Coverage Study Group, The Desirability and Feasibility of Social Security Coverage for Employees of Federal, State and Local Government and Private, Nonprofit Organizations (Washignton, D.C., 1980).

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federal retirement program with Social Security coverage of federal workers. The study group focused entirely on the defined benefit approach as the fundamental basis for the new plan designs. The reason for this was that the study group was directed to devise a coordinated retirement program that replicated, to the extent possible, the benefit structure of the current CSRS program.

In theory, the structure of the current retirement program could be maintained by full integration of the newly modified federal retirement plan with Social Security benefits provided to those covered. This strategy would establish a 100 percent offset of Social Security retirement benefits. The existing CSRS benefit formula would be retained, but the resulting benefit would be reduced by the full amount of Social Security benefits attributable to Civil Service employment. The purpose would be to maintain intact, the benefit structure of the current CSRS by neutralizing completely the redistributional effects of Social Security benefits. Social Security would provide proportionally higher benefits to employees with relatively low incomes, and the CSRS would pay proportionally higher benefits to high-income employees. A 100 percent offset approach would cost about the same as the current CSRS. The main problems with this approach are that it would be administratively complex, would require a complicated and potentially inequitable attribution of Social Security benefits, and is contrary to IRS regulations on pension integration. 5/

The strategy that the study group pursued was to design retirement

5/ See James H. Schulz and Thomas D. Leavitt, Pension Integration: Concepts, Issues and Proposals (Washington, D.C.: The Employee Benefit Research Institute, 1983) for a complete discussion of the integration rule.

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programs similar to those that prevail in existing Social Security covered employment. The overall plan designs that were developed provided average benefits that were roughly equivalent of those provided by the current system. Because of the redistributive nature of Social Security this approach would result in an increase in retirement benefits for lower income employees and a reduction for higher income employees.

One way to reduce the effects of this redistribution of benefits relative to the current system would be to offer a "thrift plan" that subsidized employees who saved for their own retirement. A thrift plan would provide an optional, contributory, supplemental annuity for individual employees. Employee contributions could be matched fully or in part by the government, with the accumulated contributions and investment earnings collectible upon retirement. High-income employees, who would have substantial earnings above the Social Security tax base, could use this option to obtain replacement rates comparable to those now produced by CSRS. The costs to the Government of a thrift plan would depend on the specified matching rate and the level of employee participation. The study group estimated that a thrift plan in combination with the modifications of the CSRS they considered would cost approximately the same as the current CSRS.

The study group devised three retirement models. The first would stand alone relative (i.e., add on) to Social Security; the second would provide a basic federal retirement benefit offset by some percentage of the annuitant's Social Security benefit; the third was a two-tier (i.e., step rate) benefit formula that would provide an increasing rate of income replacement as average salary increases. It should be noted that both the offset and step rate approaches tend to soften the redistributive nature of Social Security.

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However, in neither case would they completely neutralize it.

The study group's add-on plan is used in the following analysis to compare the relative benefits provided by a defined benefit plan in comparison to a comparably expensive defined contribution plan. The add-on defined benefit plan devised by the study group was chosen for this analysis because it is simplest given that the benefit can be computed independently of Social Security. This plan was not selected because it is considered superior to any other option being considered. It was chosen simply because substantial background analysis was already available on the structure and cost of the plan. The benefit formula for the study group's plan would provide 1.15 percent of the high three consecutive years' average salary times years of total creditable federal service. There was also an early retirement supplement in their plan design which is not discussed in this analysis.

The analysis of the various plans that the study group devised included detailed cost estimates of the various elements of their plans. The estimate of the normal cost of only the retirement benefits provided by their add-on plan was roughly 14.5 percent of payroll. The normal cost is the percentage of a worker's salary that would have to be set aside each year to fully fund that worker's retirement benefits by the time he or she retires. The average normal cost for all workers is the normal cost of the entire retirement system. The estimate that the normal cost of all retirement benefits provided by this plan would be 14.5 percent of payroll is not to say that is the normal cost for each and every worker. Also the 14.5 percent estimate does not inlcude the cost of disability or survivor benefits. The value of retirement benefits only is included because it allows an uncomplicated comparison of the benefits provided by a defined benefit versus a defined contribution plan for federal workers.

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Under both plans it is assumed that the full cost of the plan is supported by employer contributions. Further, it is assumed that both plans have identical participation standards and five year cliff vesting. It is assumed that a benefit once vested is truly vested. In the plans designed by the coverage study group it was assumed there would be post-retirement benefit indexation with rises in the Consumer Price Index.

The following discussion is based on some rather simple simulations that show benefit accruals under two pension plans. One is a defined benefit plan that provides 1.15 percent of the average high three consecutive years salary times years of service. The defined contribution plan provides an annual contribution of 14.5 percent of salary.

To show the accruals over time under the two plans the accruals of various hypothetical workers entering federal service at different ages and GS levels were simulated. The entry level positions chosen were at grades 1, 3, 5, 7, 9, 11 and 12. It was assumed that a 5 percent rate of inflation would persist throughout the simulation period. It was assumed that workers would enter federal employment on January 1, 1984 at salary rates in effect on January 1, 1983. This salary assumption is in accordance with the Reagan Administration proposal that federal salaries be frozen through 1983. The simulations assumed that real wages would grow at least 1 percent per year or as high as a 5 percent per year for the upper grade hires in their early years of federal employment. For purposes of calculating the value of accumulated contributions under the DC plan a real rate of return of 2 percent per year was assumed. A 2 percent real interest rate was also assumed for purposes of calculating the annual present values under the defined benefit plan.

Because of the volume of paper that would be involved in presenting all

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the results only those from the GS-7 and GS-9 entrants are presented. Anyone wanting copies of the other results can obtain them from the author.

Figures 1 and 2 show the results of the first simulation that was done. In this case we assumed the worker began work on his twenty-second birthday and works forty years until the eve of his sixty-second birthday. He retires at age 62 and is expected to live 18 years. The path of asterisks in the figures represent the accumulated value of contributions at the end of each year of service beyond the date of vesting. The path of ampersands shows the present value of lifetime retirement benefits at the end of each year. From a practical standpoint it makes little difference which plan type is used in this instance because both accumulate comparable benefit values for the full 40 year worker.

However, the two paths also reflect the accumulation of 22 year old entrants who leave federal service after vesting but prior to attaining age 62. Certainly under the posited assumptions such individuals would leave federal service with a larger accumulation under the DC than DB plan during their early and mid-career years. Not only is the value of the accumulation higher, it is also portable (i.e., it can be cashed out). If the retirement plan is merely a savings vehicle for individuals starting a savings program early in their career, then the DC plan is probably superior under the posited assumptions. If the plan is to provide retirement income, however, then monies cashed out of the DC plan have to be rolled into an alternative retirement account. The prevalence with which such DC cash outs become effective elements in worker's ultimate retirement portfolios is unknown. It is a sure bet, however, that there is considerable leakage of those cash outs into

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preretirement consumption.

There is also the possibility that everyone does not realize the consistent 2 percent real rates of return that were assumed in the derivation of these estimates. For example, if the real interest accruing to the DC fund parallels real rates paid on U.S. Government securities with three year maturities since 1960 then the outcome would be somewhat different than under the posited assumptions. In fact, both the GS 7 and 9 entrants would have a 10 to 11 percent smaller accumulation than shown in figures 1 and 2. The value of benefits in the DB plan would substantially exceed the DC accumulation in the latter case. There would still be a substantial period over which the DC accumulation would exceed the value of DB benefits, however. Before jumping to the conclusion that the DC option is superior to the DB plan for all but the very long service worker, alternative tenures should also be considered.

In the second set of simulations, individuals entering federal service at age 25 and reaching retirement eligibility with 30 years of service at age 55 were considered. The same entry level salary, wage growth and discounting assumptions were used as in the baseline simulation. In this instance, the individual who stays until retirement comes out significantly better off (by 25-35 percent) under the DB plan as shown in figures 3 and 4. It is the calculation process, actually the interest compounding over an extremely long period, that makes the DC plan more competitive with the DB plan up until retirement in the 40 year career case.

Additional simulations were run for individuals entering federal service in mid career and retiring at age 60 with 20 years of service. The results for the two hypothetical workers being discussed are shown in figures 5 and 6. Finally, the late entry workers who work only 10 years and retire at

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age 62 are shown in figures 7 and 8.

CONCLUSIONS

On the basis of figures 1 through 8 certain conclusions can be drawn. The individual who is covered by a DC plan early in his career and stays with the employer 10 - 15 years receives larger benefits than if covered by a comparably expensive DB plan. It is not clear that these DC benefits are necessarily devoted to retirement income security but they will generally be larger than the benefits provided by the DB plan for the short termer early in his or her career. For the individual who enters later in his or her career and stays until retirement, the defined benefit plan considered here provides superior protection.

Furthermore, the analysis here assumed certain rates of return on assets that may not prevail in actuality. If they do not there may be lower benefit accumulations under the DC plan than expected. It is the individual worker who has to face the risk of that possibility. There is an upside to that risk, however, namely that rates of return may exceed those assumed here. In the case of the DB plan there is also a certain risk -- that being that the employer will be unable to support the plan at some future point in time. Among private plans this is primarily the risk of business failure and has been addressed to a certain extent by the PBGC. In the federal plan it is not economic risk as much as political risk that faces the DB plan participants.

The questions posed by the different benefit structures inherent in defined benefit and defined contribution plans give all the parties concerned about federal retirement much to ponder. Neither the DB nor DC plan is perfect to meet everyone's goals. To make matters even more confusing the options that will be discussed in coming months may look considerably different than those

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analyzed here. The differences in the options may lead to somewhat different conclusions than this analysis.

As the discussion evolves and the legislation development begins everyone should understand that there are good reasons for and against both plan types. That, more than any other reason, may account for the fact that most large employers in the United States today have both a defined benefit and defined contribution plan for their workers.

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Figure 1

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR
FOR A HYPOTHETICAL FEDERAL WORKER HIRED AT THE GS-7 LEVEL ON JANUARY 1, 1984, WHO WORKS A 40 YEAR CAREER AND RETIRES AT AGE 62

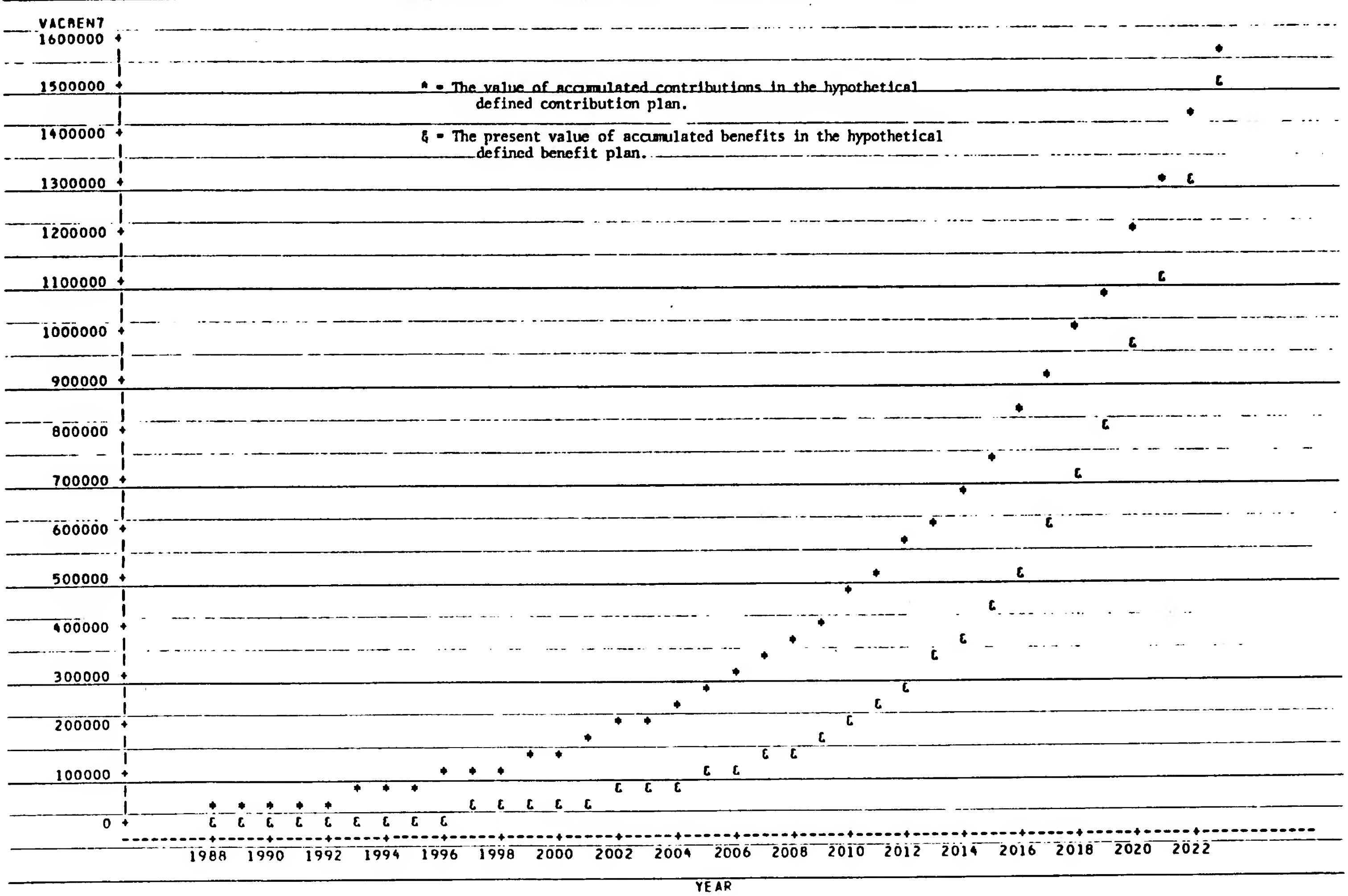

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Figure 3

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR
FOR A HYPOTHETICAL FEDERAL WORKER AT THE GS-7 LEVEL ON JANUARY 1, 1984, WHO WORKS A 30 YEAR CAREER AND RETIRES AT AGE 55

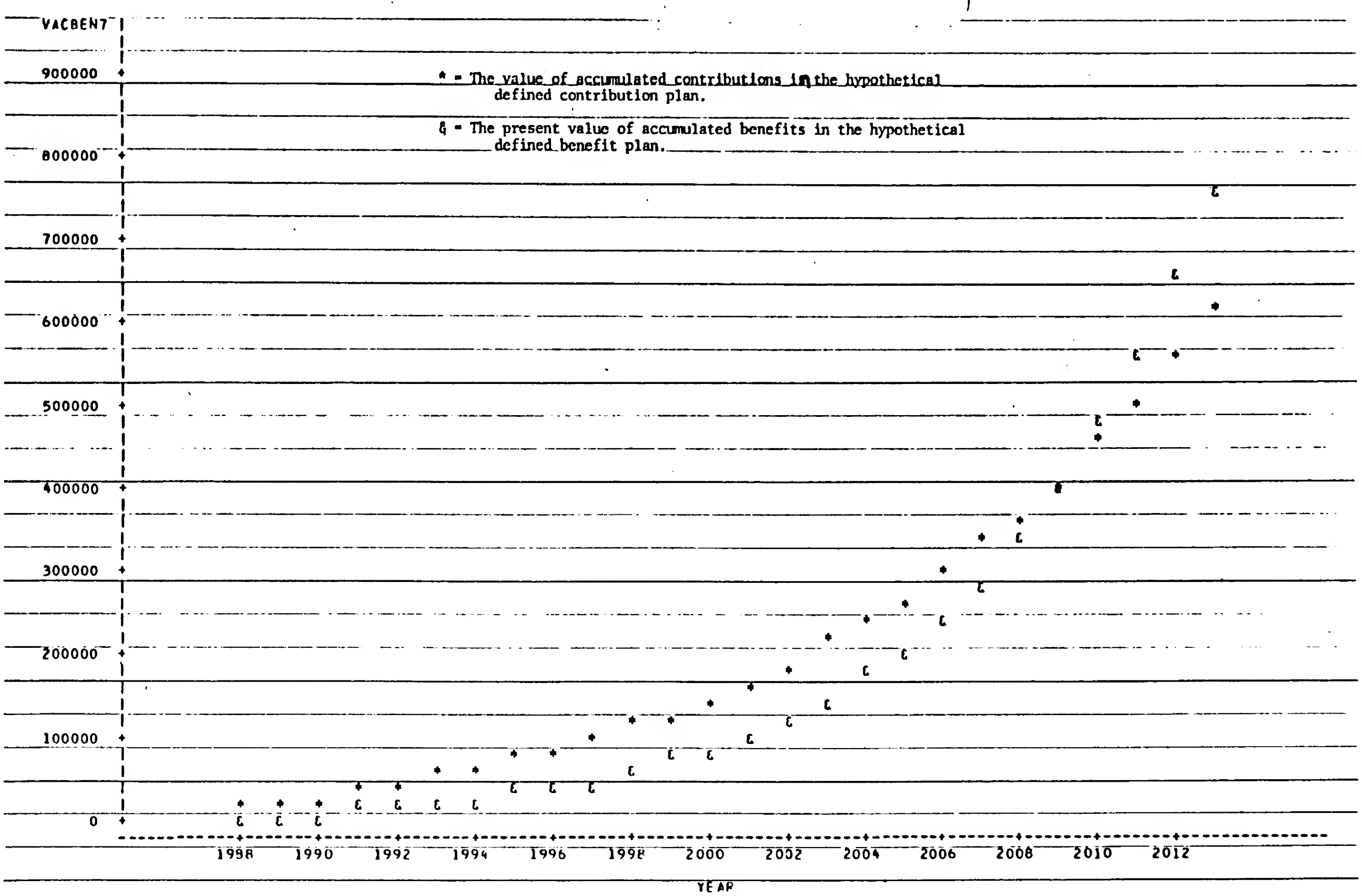

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Figure 2

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR FOR A HYPOTHETICAL FEDERAL WORKER HIRED AT THE GS-9 LEVEL ON JANUARY 1, 1984, WHO WORKS A 40 YEAR CAREER AND RETIRES AT AGE 62

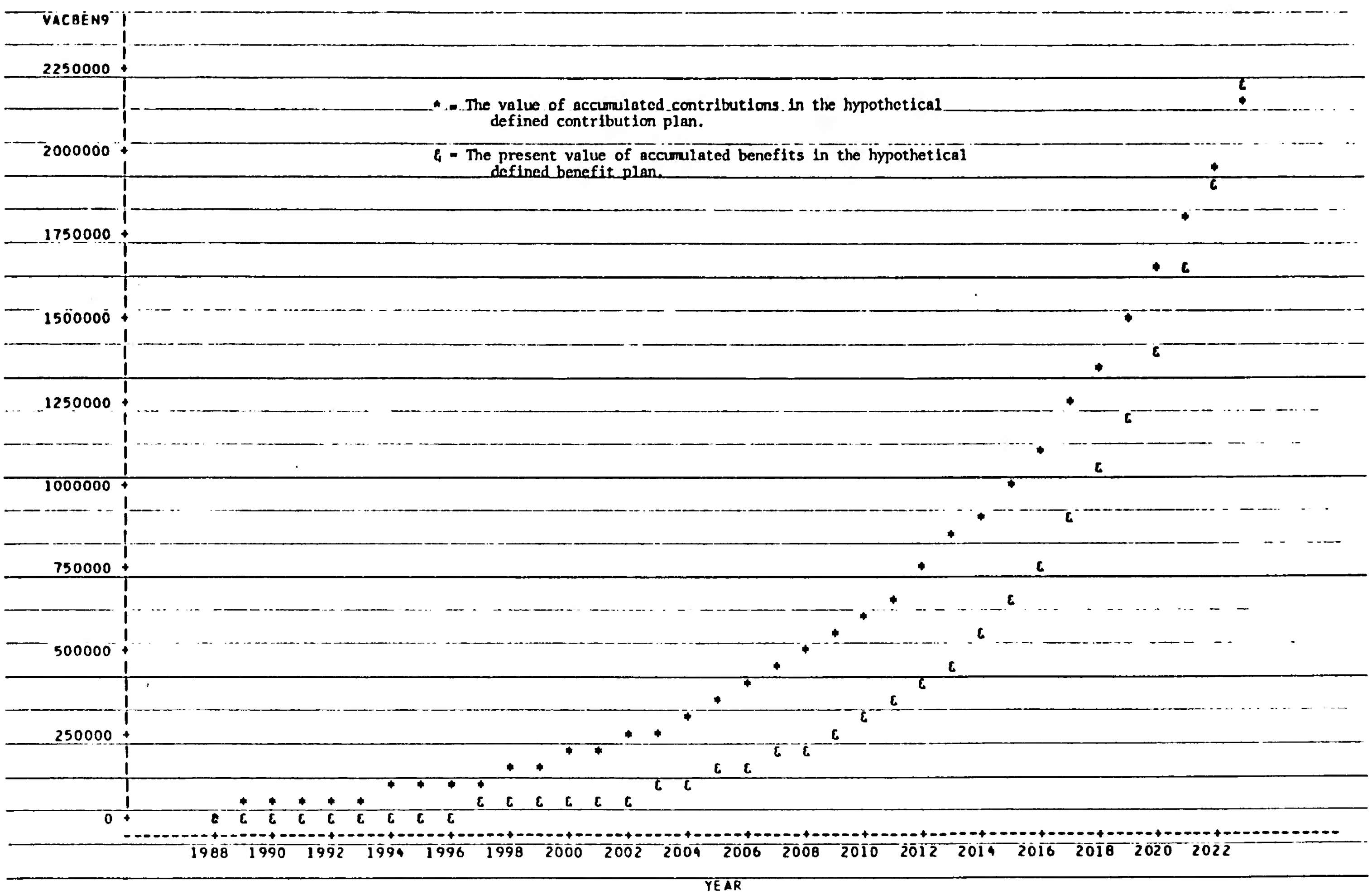

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Figure 4

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR FOR A HYPOTHETICAL FEDERAL WORKER AT THE GS-9 LEVEL ON JANUARY 1, 1984, WHO WORKS A 30 YEAR CAREER AND RETIRES AT AGE 55

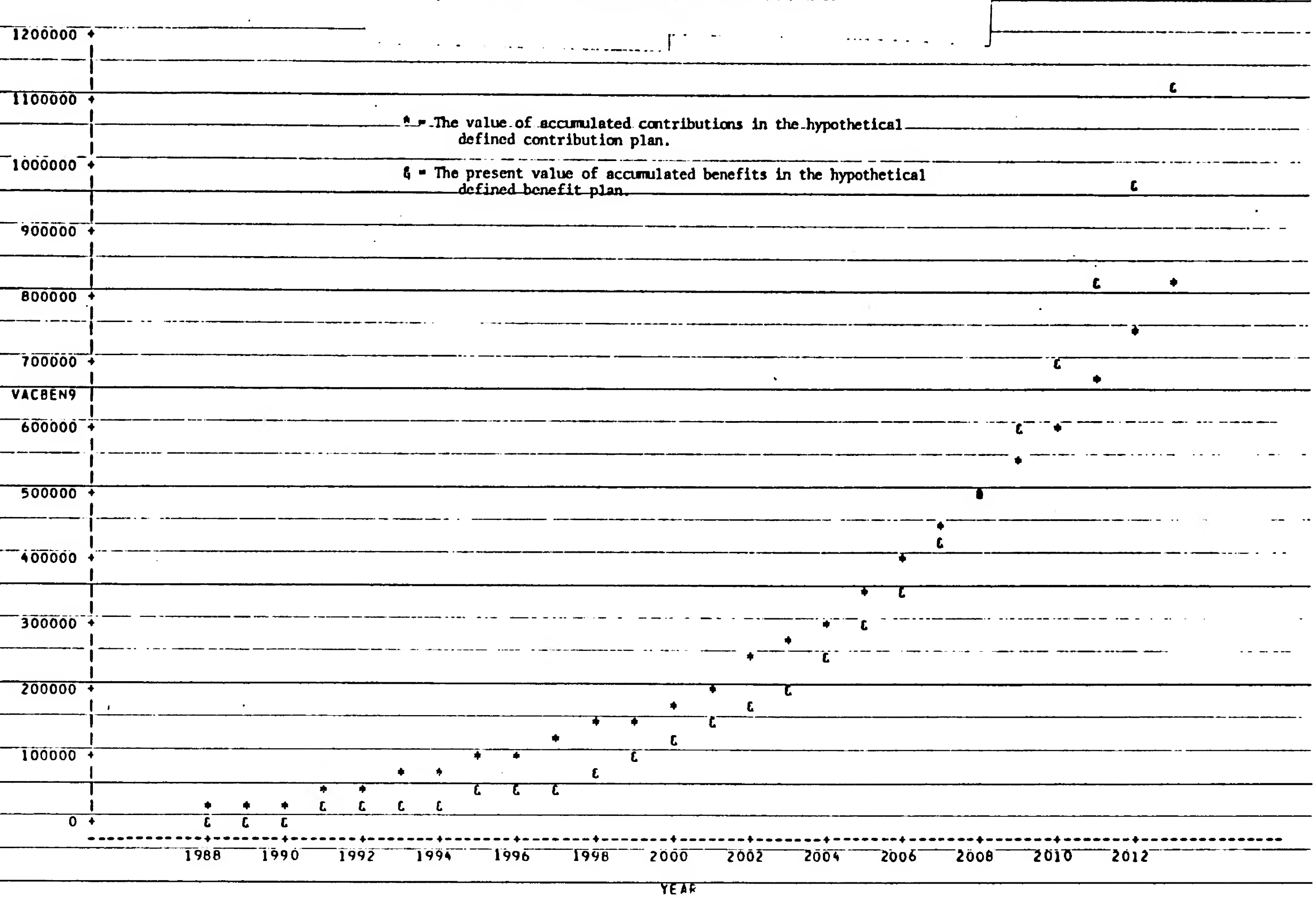

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Figure 5

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR FOR A HYPOTHETICAL FEDERAL WORKER HIRED AT THE GS-7 LEVEL ON JANUARY 1, 1984, WHO WORKS 20 YEARS AND RETIRES AT AGE 60

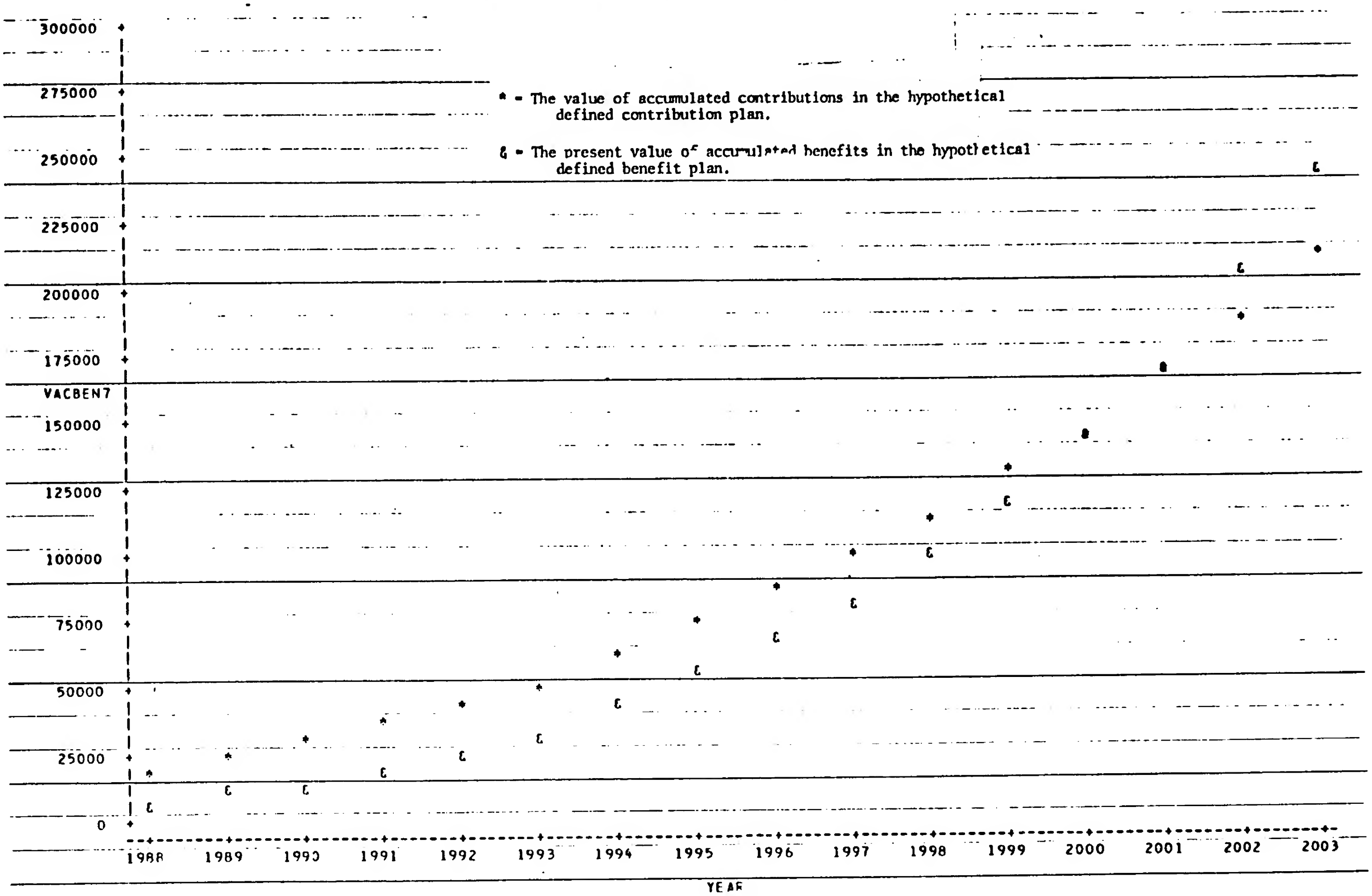

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Figure 6

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR FOR A HYPOTHETICAL FEDERAL WORKER HIRED AT THE GS-9 LEVEL ON JANUARY 1, 1984, WHO WORKS 20 YEARS AND RETIRES AT AGE 60

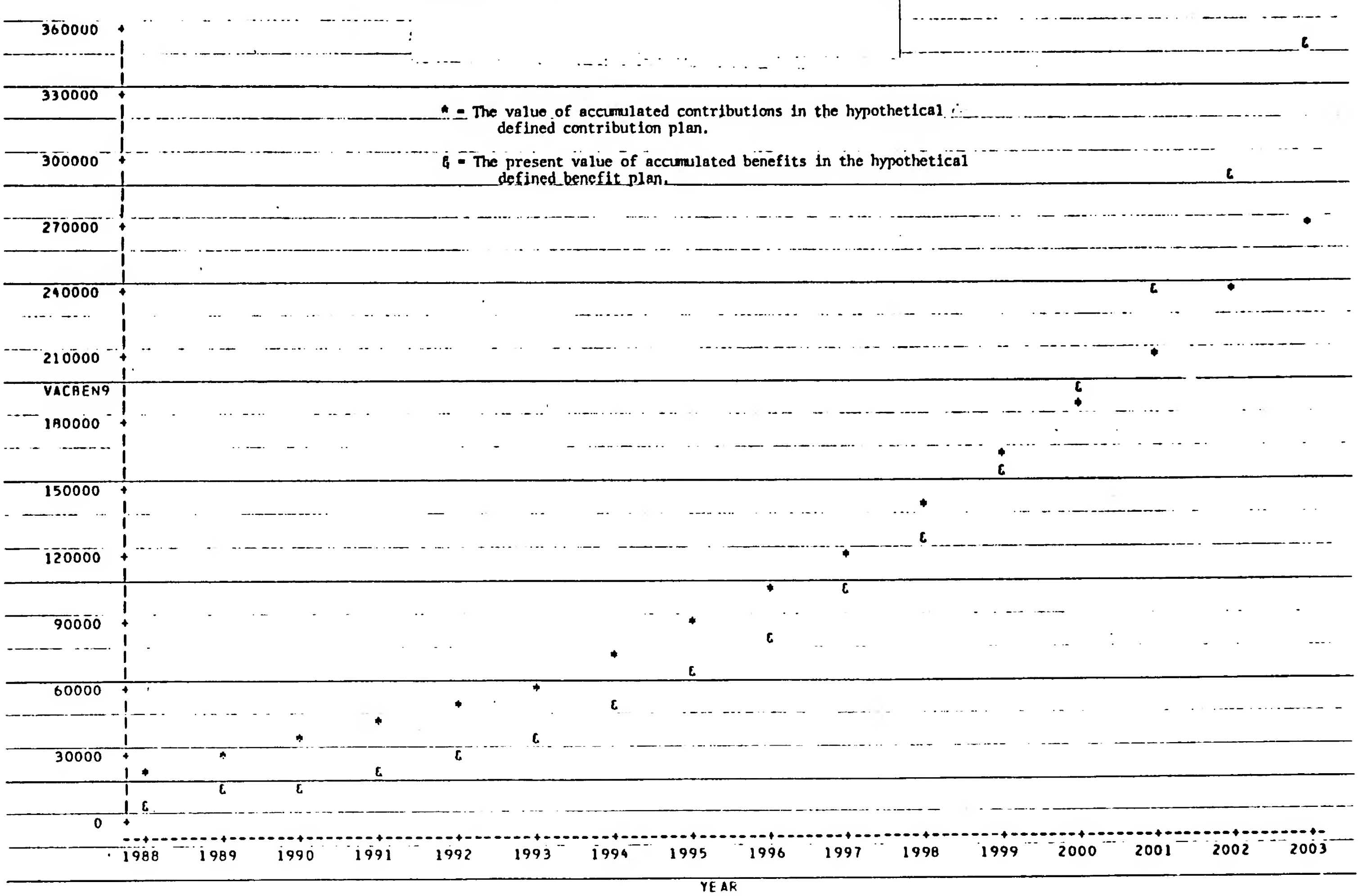

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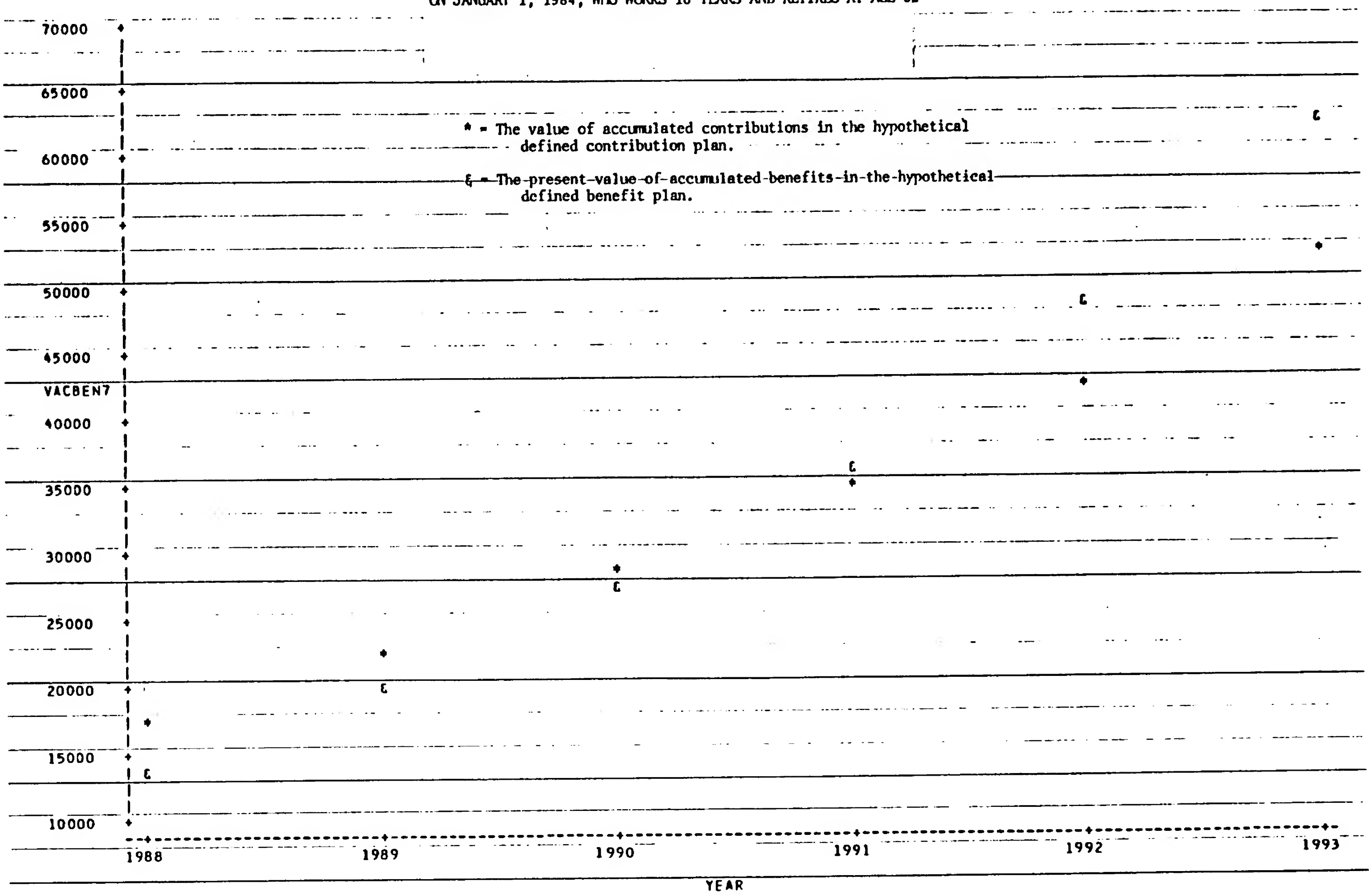
Figure 7

ACCUMULATED BENEFITS AND PRESENT VALUE OF BENEFITS BY YEAR FOR A HYPOTHETICAL FEDERAL WORKER HIRED AT THE GS-7 LEVEL ON JANUARY 1, 1984, WHO WORKS 10 YEARS AND RETIRES AT AGE 62



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